687. A saturated solution of sulphate of soda was put into the cell, and the electrodes connected with a battery of 150 pairs of 4-inch plates: the current of electricity was conducted across the cell so freely, that the discharge was as good as if a wire had been used. A ray of polarised light was then transmitted through this solution, directly across the course of the electric current, and examined by an analysing plate; but though it penetrated seven inches of solution thus subject to the action of the electricity, and though contact was sometimes made,, sometimes broken, and occasionally reversed during the observations, not the slightest trace of action on the ray could be perceived,

688. The large electrodes were then removed, and others introduced which fitted the *ends* of the cell. In each a slit was cut, so as to allow the light to pass. The course of the polarised ray was now parallel to the current, or in the direction of its axis (253); but still no effect, under any circumstances of contact or disunion, could be perceived upon it.

689. A strong solution of nitrate of lead was employed instead of the sulphate of soda, but no effects could be detected.

690. Thinking it possible that the discharge of the electric forces by the successive decompositions and recompositions of the particles of the electrolyte might neutralise and therefore destroy any effect which the first state of tension could by possibility produce, I took a substance which, being an excellent electrolyte when fluid, was a perfect insulator when solid, namely, borate of lead, in the form of a glass plate, and connecting the sides and the edges of this mass with the metallic plates, sometimes in contact with the poles of a voltaic battery, and sometimes even with the electric machine, for the advantage of the much higher intensity then obtained, I passed a polarised ray across it in various directions, as before, but could not obtain the slightest appearance of action upon the light. Hence I conclude, that notwithstanding the new and extraordinary state which must be assumed by an electrolyte, either during decomposition (when a most enormous quantity of electricity must be traversing it), or in the state of tension which is assumed as

preceding decomposition, and which might be supposed to be retained in the solid form of the electrolyte, still it has no power of affecting a polarised ray of light; for no kind of structure or tension can in this way be rendered evident.

691. There is, however, one beautiful experimental proof of a state of tension acquired by the metals and the electrolyte